

## **Remarks**

### **Summary**

In paragraph 1 of the office action, claims 1-11, 16 and 28 were rejected under 35 USC 102(b) as anticipated by Cochran, et al. Applicants herein traverse this rejection.

In paragraph 3 of the office action, claims 12-16, 19-21 were rejected under 35 USC 103(a) as being obvious over Cochran et al. Applicants herein traverse this rejection.

In paragraph 4 of the office action, claims 17, 18, 22-24 are objected to as being dependant upon a rejected base claims, but would be allowable if rewritten in independent form. Applicants thank the examiner for this recognition of patentability.

### **Legal Standards for §102 and §103 Rejections**

First, before addressing the above rejections under § 102, the Applicants would like to respectfully address legal precedent regarding 35 U.S.C. §§ 102-103 as stated in the Manual of Patent Examining Procedure.

First, Applicants wish to point out that for a reference to be an anticipation of an invention, it must be enabling. For example, “[I]n determining that quantum of prior art disclosure which is necessary to declare an applicant’s invention “not novel” or “anticipated” within section 102, the stated test is whether a reference contains an “enabling disclosure.”... .” *MPEP 2121.01, citing In re Hoeksema, 399 F.2d 269, 158 USPQ 596 (CCPA 1968)*. It “**must** provide an enabling disclosure of the desired subject

matter; mere naming or description of the subject matter is insufficient if it cannot be produced without undue experimentation.” *Id*, internal citation omitted, emphasis added. Here, in simple terms, if it is shown that the reference does not work, then it is not prior art with respect to §102.

Second, with respect to § 103, Applicants wish to note that every claim at issue should be considered “as a whole” and the prior art likewise should be considered “as a whole”, rather than using “selected bits and pieces from prior patents that might be modified to fit its legally incorrect interpretation of each claim as consisting of one word.” A test rejected in *Panduit Corp v. Dennison Manufacturing Co.*, 1 USPQ 2d 1593, 1605 (Fed Cir. 1987).

Using this analytical framework, under § 103, a patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 if the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. 35 U.S.C. § 103(a). The language “obvious at the time the invention was made” has been held by the Courts to mean that it is inappropriate for the Examiner to use “hindsight” in determining obviousness. *Panduit Corp. v. Dennison Mfg. Co.*, 774 F.2d 1082 (Fed. Cir.1985).

Nor can it be lawfully asserted that it would have been obvious, at the time of the Applicant’s invention, to try varying conditions. “Obvious to try” has been expressly and repeatedly condemned as the standard under §103. *See, In re Geiger*, 2 USPQ2d 1276,

1278 (Fed. Cir. 1987) and the case precedent cited therein, including *In re Goodwin*, 198 USPQ 1, 3 (CCPA 1978) which states:

At best, the PTO has shown evidence that it would have been obvious to the skilled artisan to try Margrave's carbon monofluorides. However, this court has consistently refused to recognize "obvious to try" rejections. "As we have said many times, obvious to try is not the standard of 35 USC 103. [*Citation omitted*]"

With respect to §103, the MPEP states that, to establish a *prima facie* case for obviousness, three basic criteria must be met: 1) a suggestion or motivation to modify the reference or combine the reference teachings; 2) a reasonable expectation of success; and 3) the prior art must teach or suggest all of the elements of the claim. See MPEP §2143.

Finally, should a *prima facie* case of obviousness be established by the office, this case may be overcome by sufficient objective evidence of secondary considerations. See MPEP §2141. In situations such as the instant claims, where the claimed ranges overlap or touch upon ranges disclosed in the prior art, the *prima facie* case may be overcome by 1) evidence of unexpected results; 2) an indication within the prior art that teaches away from the claimed range; and 3) evidence of the criticality of the claimed ranges. See MPEP §2144.

### **Argument**

#### **Introduction**

Applicant respectfully traverses the rejections contained in the instant office action. Cochran, when read as a whole, is simply not enabling for the invention.

First, Applicants submit that the Cochran article is evidence that prior to the invention, humidified carbon dioxide or other atmospheres did not improve the surface quality of ingots. In short, Cochran contains descriptive and pictorial evidence that demonstrate unequivocally that Cochran is a non-enabling reference and therefore does not anticipate the present invention.

Second, the specific teachings of humidified atmosphere provided by Cochran teach away from its use since it teaches that humidity causes surface porosity and Mg depleting mushroom-like growth. At most it is an invitation to experiment, albeit one that provides no basis for one of ordinary skill to begin work, (i.e. no reproducible/positive results) such that undue experimentation would be required to reach the present invention. Therefore, Cochran cannot render the present invention obvious

**I. Cochran Does Not Enable Using Humidified Atmospheres or Carbon Dioxide, And Is Therefore Not Prior Art Under §102**

**In response to the rejection in paragraph 1 of the Office Action,** Applicants respectfully traverse this rejection. Applicants respectfully point out that Cochran, when read as a whole, is demonstrably not enabling.

First, the improvements in sample appearance obtained with the present invention were never produced by Cochran (absent 0.0003 wt.% Be). In relevant part, Cochran on page 325 describes his results as follows:

- “Whenever the atmosphere contained water vapor, hydrogen from the reaction of metal and water dissolved in the sample, and was partially expelled when the sample froze, causing visible porosity” (Col. 2, 2<sup>nd</sup> ¶)

- Unusual growths up to 12mm high formed on the melt surface (Col. 2, bridging ¶)
- The growths contained high concentrations of magnesium oxide, meaning that they depleted the aluminum of a strength increasing alloying element (Col. 2, bridging ¶)
- “Except in moist air” the growths decreased in size... at temperatures above 750°C (Col. 2, bridging ¶)
- “Grape-like growth clusters” were noted in moist air with higher temperatures (Id.), and
- The appearance of samples following oxidation was difficult to reproduce” even under duplicate conditions. (Col 1, last ¶).

Visible porosity? Grape Like, Mg Depleting Growths? And even these results were “difficult” to reproduce under “duplicate” conditions? This is clear and irrefutable evidence that Cochran is simply not enabled. However, if moist air did not improve ingot appearance, what did Cochran report as improving oxide growth and appearance?

Essentially, Cochran simply confirms that the addition of beryllium or elements improves ingot appearance and oxide growth: on page 326, Cochran describes how “as little as 0.001 beryllium inhibited the oxidation of a 3.4 pct magnesium alloy for at least 46 h at 800°C, whereas without the beryllium, breakaway oxidation started shortly after melting.”

However, as pointed out in the present application, **“beryllium has been banned...”** from aluminum products used for food and beverage packaging. Application,

¶3. (Applicant's further submit for the record that they believe beryllium's toxicity will likely lead to a complete ban in the use of aluminum production).

The non-enablement of humidity (and requirement of the now-banned Be) is further shown in the Cochran's figures on page 325. There, ingots produced in a humid atmosphere had oxides are depicted (from left to right) having 1) an overgrown oxide with visible porosity (0 Be); 2) numerous grape like Mg depleting clusters (0.0001% Be); 3) had numerous grape like Mg depleting clusters (though possibly fewer than before) (0.0002%Be); and 4) a good protective oxide (0.0003% Be). All of these were produced in air with the same low humidity but with increasing additions of Be. Cochran clearly evinces that Be improved oxide growth and appearance, while humidified air produced poor results. These results are simply overwhelming proof that Cochran is not an enabling disclosure.

Please note, the application also provides confirmation on this point. A comparison of the applications figures showing the prior art results with Cochran's figures shows that Cochran's results on the far right (1) with humidified air are identical to those of the prior art (Application Figs 8, 10, etc.) with no humidity. At the same time, Cochran's results with 0.0003 Be addition are apparently almost identical to those produced by the present invention as shown for example in Figs. 9 and 19 of the application. (See attached Color Figures, submitted for the Examiner's convenience.)

In short, the evidence of record is overwhelming and irrefutable that Cochran is not an enabling disclosure and therefore should not be applied to the instant invention as prior art under §102.

Applicants therefore respectfully request that this rejection be withdrawn and the application allowed to issue.

## **II. In Addition to Being Non-Enabling, When Read as a Whole, Cochran Teaches Away from the Invention**

**In response to the rejection in paragraph 3 of the Office Action,** Applicants respectfully traverse this rejection. First, as Applicants have respectfully pointed out Cochran, when read as a whole, is demonstrably not enabling. Second, it is further submitted the above teachings teach away from the present invention. At most, the passage cited by the examiner would amount to an invitation to experiment, one that is overridden by the negative results Cochran reports and depicts. One of ordinary skill, even if they did view Cochran as an invitation to experiment, would start there experiments from scratch and thus be faced with what should by definition be considered to be undue experimentation. Therefore, Cochran cannot be said to render the present invention obvious.

First, as pointed out above, Cochran's work required the use of Be, and even then, resulted in Mg-containing surface growths and surface porosity. One of ordinary skill would immediately understand this to mean that despite any improvement in "protection", humidified atmospheres were not enabled to improve ingot surface quality.

Second, when read as a whole, the passages on the above described surface problems and the depictions of these problems, simply teach away from further experimentation with humidified atmospheres. Grape-like growths, Mg depletion, surface porosity, now banned Be additions, these all teach against attempting further experiments with humidified atmospheres. One of ordinary skill, reading Cochran as a whole, simply could not be motivated to attempt further experimentation, and since all of Cochran's actual reported results with humidity are extremely negative, in light of these results, one of ordinary skill would be starting from scratch in terms of necessary experimentation in order to produce the invention even if they were so motivated. In short, Cochran provides 1) a non-enabling disclosure that 2) provides at most an invitation to experiment but actually; 3) teaches away from the invention and 4) would therefore require undue experimentation to reach the invention.

Cochran therefore fails to raise even a scintilla of a *prima facie* case for obviousness, and allowance is therefore respectfully requested.



If the Examiner would like to suggest changes of a formal nature to place this application in better condition for allowance, a telephone call to Applicants' undersigned attorney would be greatly appreciated.

CUSTOMER NUMBER

**08840**

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